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# Internetwork infrastructure requirements for virtual environments

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1   Bell, Gavin, Parisi, Anthony and Pesce, Mark, "The Virtual Reality Modeling Language (VRML) Version 1.0 Specification," 26 May 1995. Available via the VRML Repository at http://w~v.sd.~'c.edu/vrml

2   Tim Berners-Lee , Robert Cailliau , Ari Luotonen , Henrik Frystyk Nielsen , Arthur Secret, The World-Wide Web, Communications of the ACM, v.37 n.8, p.76-82, Aug. 1994

3   Brutzanan, Donald P., A Virtual World for an Autonomous Underwater Vehicle, Ph.D. Dissertation, Naval Postgraduate School, Monterey California. December 1994. Available at http:/ ww.stl.nps.na~.mil/- brutzman/dissertation/

4   Brutzman, Don, "Remote Collaboration with Monterey Bay Educators," Visual Proceedings, Association for Computhzg Machbzerv (ACM) Special Interest Group opt Computer Graphics (SIGGRA PH) 95, Los Angeles California, Atlgust 7-11 1995, p. 145.

5   Brutzman, Don, "Networked Ocean Science Research and Education, Monterey Bay California,"

Proceedings of International Networking (INET) 95 Conference, Internet Society, Honolulu Hawaii, June 27-30 1995. Available at h ttp." //in e t. n ttam . com /HM P /PA PER/03 9

6   Brutzman, Don and Reimers, Stephen, "Internet Protocol over Seawater: Towards Interoperable Underwater Networks," Unmanned Untethered Submersibles Technology 95. Northeastern University, Nahant Massachusetts, September 25-27 1995, to appear.

7   Douglas E. Comer, Internetworking with TCP/IP (2nd ed.), vol. I, Prentice-Hall, Inc., Upper Saddle River, NJ, 1991

8   Cruz-Neira, Carolina, Leigh, Jason. Papka. Michael, Barnes. Craig, Cohen, Steven M., Das, Sumit, Engelmarm, Roger, Hudson, Randy, Roy, Trina, Siegel. Lewis. Vasilakis. Christina, DeFanti, Thomas A. and Sandin, Daniel J., "Scientists in Wonderland: A Report on Visualization Applications in the CAVE Virtual Reality Environment," IEEE 1993 Symposium on Research Frontiers in Virtual Reali~. '. San Jose California, October 25-26 1993.pp. 59-66 and CP-3.

9   Curtis, Pavel and Nichols, David A., "MUDs Grow Up: Social Virtual Reality in the Real World," Proceedings of the IEEE Computer Conference, IEEE Computer Society Press, Los Alamitos California, 1994, pp. 193-200. Available at flp ://fip.parc.xerox. com/pub/MOO/papers/MUDsGrowUp.ps

10   Deering, Steve, "Host Extensions for IP Multicasting," Request for Comments (RFC) 1112, August 1989. Available at tip ://ds.internic.net/rfc/rfcl I 12.txt

11   Durlach, Nathaniel !. and Mavor, Anne S., editors, Virtual Realio,. Scientific attd Technological Challenges, National Research Council, National Academy Press, Washington DC, 1995.

12   Foley, Jim and Pitkow, James, ed., Research Priorities for the WorM-Wide Web, National Science Foundation (NSF) Information, Robotics and Intelligent Systems Division Workshop, Arlington Virginia, October 31 1994. Available at http : //wn~. co. g at e ch. edu /g vu /nsf-ws /repo rt /R epo rt. h tml

13   David Gelernter, Mirror worlds or the day software puts the universe in a shoebox: how will it happen and what it will mean, Oxford University Press, Inc., New York, NY, 1991

14   Hughes, Kevin, "Entering the World-Wide Web (WWW): A Guide to Cyberspace," Enterprise Integration Technology Inc., May 1994. Available at http://www.eit.com/webAvww.guide/

15   IEEE Standard for Information Technology- Protocols for Distributed Interactive Simulation (DIS) Applications, version 2.0, Institute for Simulation and Training report IST-CR-93-15, University of Central Florida, Orlando Florida, May 28 1993.

16   Internet Network Information Center (NIC), Request For Comments (RFC) archive, flp://ds.internic.net, 1994.

17   International Wide-Area Year (I-WAY) project, 1995, information available at http://www.iway.org

18   Michael R. Macedonia , Donald P. Brutzman, MBone Provides Audio and Video Across the Internet, Computer, v.27 n.4, p.30-36, April 1994

19   Macedonia, Michael R., A Network Software Architecture for Large Scale Virtual Environments, Ph.D. Dissertation, Naval Postgraduate School, Monterey California, June 1995.

20   Michael R. Macedonia , Michael J. Zyda , David R. Pratt , Donald P. Brutzman , Paul T. Barham, Exploiting Reality with Multicast Groups, IEEE Computer Graphics and Applications, v.15 n.5, p.38-

45, September 1995

21   John K. Ousterhout, Tcl and the Tk toolkit, Addison-Wesley Longman Publishing Co., Inc., Boston, MA, 1994

22   Pesce, Mark and Behlendorf, Brian, moderators, "Virtual Reality Modeling Language (VRML)," working group mail list, 1994-1995. Archived at http.'//vrml, wired, corn~

23   Schulzrinne, Henning and Casner, Stephen, "RTP: A Transport Protocol for Real-Time Applications," Audio-Video Transport Working Group, Internet Engineering Task Force, working draft, Oct. 20, 1993. Available at f-tp://nic.ddn.mil/internet-drafls/dra fl-ie~-avt-rtp-O4.ps

24   William Stallings, Data and computer communications (3rd ed.), Macmillan Publishing Co., Inc., Indianapolis, IN, 1991

25   Sun Microsystems Corporation, Java language home page, 1995, http ://java.sun. com/

26   Josie Wernecke, The Inventor Mentor: Programming Object-Oriented 3d Graphics with Open Inventor, Release 2, Addison-Wesley Longman Publishing Co., Inc., Boston, MA, 1993

27   Zyda, Michael J., Pratt, David R., Falby, John S., Barham, Paul T., Lombardo, Chuck and Kelleher, Kristen M., "The Software Required for the Computer Generation of Virtual Environments," PRESENCE: Teleoperators at~ Virtual Environments, vol. 2 no. 2, MIT Press, Cambridge Massachusetts, Spring 1993, pp. 130-140.

↑ **CITINGS**

Sungwoo Park , Taisook Han, Object-oriented VRML for multi-user environments, Proceedings of the second symposium on Virtual reality modeling language, p.25-32, February 24-26, 1997, Monterey, California, United States

↑ **INDEX TERMS**

**Primary Classification:**
  **D.** Software
↳ **D.2** SOFTWARE ENGINEERING
  ↳ **D.2.1** Requirements/Specifications
    ↳ **Subjects:** Methodologies (e.g., object-oriented, structured)

**Additional Classification:**
  **C.** Computer Systems Organization
↳ **C.2** COMPUTER-COMMUNICATION NETWORKS
  ↳ **C.2.1** Network Architecture and Design

    ↳ **Nouns:** Internet

  **D.** Software
↳ **D.2** SOFTWARE ENGINEERING

  **I.** Computing Methodologies

↳ **I.3** <u>COMPUTER GRAPHICS</u>

  ↳ **I.3.7** <u>Three-Dimensional Graphics and Realism</u>

    ↳ **Subjects:** <u>Virtual reality</u>

**General Terms:**
<u>Algorithms</u>, <u>Design</u>, <u>Languages</u>, <u>Performance</u>, <u>Theory</u>

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